

X3 Frequency Multiplier

RMK-3-722+

50Ω Output 4575 to 7200 MHz

The Big Deal

- Broadband, output frequency 4575 to 7200 MHz
- High rejection of adjacent harmonics, 55dB below the carrier, F3
- Small package size, 0.25" x 0.3"
- Low cost \$6.45, quantity of 1000



CASE STYLE: TT1224

Product Overview

The RMK-3-722+ is a self contained frequency tripler that does not require external components. It is constructed using a specially designed diode quad ring configuration to enable high rejection of adjacent harmonics. The tripler is packaged in a miniature 0.3" x 0.25" case, with wrap-around terminations to enable convenient high density assembly.

Key Features

Feature	Advantages
Broadband frequency tripler Input 1525 to 2400 MHz Output 4575 to 7200 MHz	Enables the use of low frequency VCO's and Synthesizers to provide high frequency sources at low cost.
Low conversion loss, 14 dB	Enables output power to be sufficiently high so that amplifier gain requirements following the tripler is reduced.
High rejection of adjacent harmonics, F2 and F4, 55 dB	Extremely high rejection of F2 and F4 harmonics enables a significant reduction of unwanted signals without the need for filters.
Low cost	Enables a practical solution to achieve high frequency sources from low cost, lower frequency VCO's and synthesizers.

Notes

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



50Ω Output 4575 to 7200 MHz



+RoHS Compliant

The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Input Power	17 dBm
Permanent damage may occur if any of these limits are exceeded	

INPUT	1
OUTPUT	4
GROUND	2,3,5,6

TOP VIEW

SIDE VIEW

BOTTOM VIEW

PCB Land Pattern

Suggested Layout, Tolerance to be within ± 0.02

A	B	C	D	E	F	G	H
.25	.31	.16	.100	.040	.055	.060	.065
6.35	7.87	4.06	2.54	1.02	1.40	1.52	1.65
J	K	L	M	N	P	Q	wt.
.300	.060	.160	.025	.100	.110	.070	grams
7.62	1.52	4.06	0.64	2.54	2.79	1.78	0.16

Figure 1 is a technical drawing of the 17X4020 package, showing its dimensions. The package is rectangular with a central area containing a grid of pins. The dimensions are as follows:

- Trace Width:** .066 TRACE WIDTH, 3 PL. (SEE NOTE BELOW)
- Pin Pitch:** .037, 2 PL.; .030, TYP.
- Pin Spacing:** .040, 2 PL.; .020, 2 PL.
- Package Outline:** .060, 2 PL.
- Pin Array:** 2X .065
- Ground Pads:** 17X .020 PTH FOR GROUND
- Pin 6:** PIN 6
- Pin Spacing (Bottom):** .020, 2 PL.
- Pin Spacing (Bottom):** 4X .050

NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" $\pm$.002"; COPPER: 1/2 OZ. EACH SIDE.
2. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

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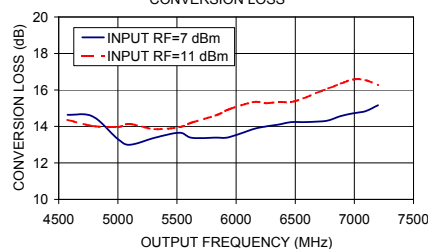
- broadband
- low conversion loss, 14 dB typ.
- high rejection F2, 55 dBc typ.; F4, 55 dBc typ.
- low cost
- aqueous washable

- synthesizers
- local oscillators
- satellite up and down converters

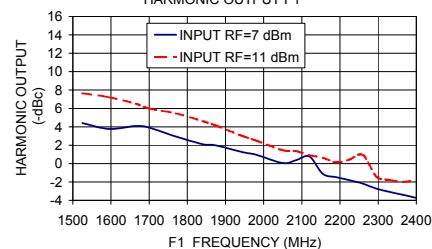
MULTIPLICATION FACTOR	FREQUENCY (MHz)		INPUT POWER (dBm)		CONVERSION LOSS (dB)		*HARMONIC OUTPUT (dBc)					
	F3						F1		F2		F4	
	Input	Output	Min.	Max.	Typ.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.
3	1525-2400	4575-7200	7	11	14	19	3	-7	55	35	55	35

* Harmonics of input frequency below the power level of F3

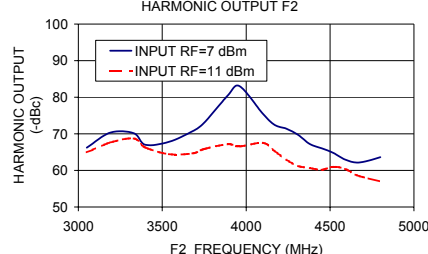
INPUT RF= 7 dBm					INPUT RF= 11 dBm			
Input Frequency (MHz)	Conversion Loss (dB)	Harmonic Output Below F3 (-dBc)			Conversion Loss (dB)	Harmonic Output Below F3 (-dBc)		
		F3	F1	F2		F4	F3	F1
1525	14.64	4.41	66.20	60.80	14.36	7.65	64.92	64.88
1595	14.55	3.77	70.33	60.53	14.03	7.22	67.62	63.06
1665	13.34	4.09	70.15	61.60	13.96	6.51	68.73	64.22
1700	12.99	3.91	67.00	62.08	14.14	6.00	66.24	66.54
1770	13.38	2.95	67.80	62.08	13.85	5.46	64.45	71.46
1840	13.65	2.11	70.68	65.00	13.96	4.62	64.63	71.87
1875	13.38	1.98	73.03	66.20	14.21	4.14	65.84	68.75
1945	13.39	1.24	80.44	62.98	14.62	3.00	67.16	65.50
1980	13.41	0.97	83.05	62.93	14.94	2.50	66.55	65.71
2050	13.86	0.07	75.46	61.91	15.34	1.45	67.55	62.15
2085	14.00	0.37	72.44	62.33	15.27	1.35	65.32	60.38
2120	14.10	0.76	71.38	64.92	15.34	0.92	62.92	57.20
2155	14.24	-1.11	69.70	67.06	15.34	0.63	61.18	55.31
2190	14.24	-1.47	67.22	68.30	15.54	0.12	60.65	54.71
2225	14.26	-1.81	66.05	65.52	15.82	0.44	60.15	54.46
2260	14.33	-2.18	64.76	62.89	16.08	0.93	61.00	54.93
2295	14.57	-2.72	62.98	62.03	16.35	-1.40	60.43	55.45
2330	14.72	-3.08	62.15	62.39	16.57	-1.77	58.69	56.19
2365	14.84	-3.40	62.66	62.31	16.54	-1.98	57.82	56.21
2400	15.16	-3.74	63.61	62.98	16.26	-1.80	56.96	56.16

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CONVERSION LOSS

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HARMONIC OUTPUT F1



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